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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/581,459
Filing Date: June 01, 2006
Appellant(s): HAHNLE ET AL.

Richard L. Treanor
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5/23/2011 appealing from the Office action mailed 10/27/2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

It should be noted that that another BPAI panel has discussed the primary reference applied in the instant rejection in a decision rendered 7/5/2011 on appeal in case 11/181993.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 4 and 6-11 are pending and are rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office

action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

3,639,208	Varveri et al	02-1972
3,933,558	Takahata et al	01-1976
5,830,318	Snow et al	11-1998
6,184,310	Utecht et al	02-2001
2004/0250972	Carr, D.	12-2004
EP 331047 A1	Lai et al	09-1989

Machine translation of JP 09-217292 to Koichi et al, 8/19/1997.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 4 and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Utecht et al (US 6184310) in view of Carr (US 2004/0250972) and further in view of Takahata et al, Snow et al and Koichi et al, and as evidenced by Lai et al (EP-331047 A1) and Varveri et al (US 3639208)..

Utecht et al discloses polymers containing vinylamine units made by converting from 0.1% to 100% of the formyl groups to vinylamine by acid hydrolysis in a polymer containing N-vinylformamide units. At least 0.1 mol-%, of the vinylamine units are further converted to carbamate moieties (Abs; col 2, lines 4-21 and 33-55; col 3, line 59 to col 4, line 39; col 6, lines 1-7), which leaves in some embodiments the majority of vinylamine units unconverted. Note that the open language of the instant claims does not preclude additional reaction of some of the vinylamine units. The claimed additional monomers copolymerized with the N-vinylformamide are disclosed (col 2, line 56 to col 3, line 58). The polymers made by acid hydrolysis are cationic (see Lai et al p 5, lines 24-39 if evidence is needed).

The polymers are used as retention and drainage aids and as fixatives for making all known paper, paperboard and cardboard grades by adding them to the stock from 0.01% to 0.1% by weight of the dry fiber. Many of the claimed pulps are disclosed. Suitable fillers used in making papers include chalk (calcium carbonate) and titanium dioxide (col 6, line 56 to col 7, line 7; col 7, lines 14-18).

Utecht et al does not disclose the claimed papermaking process or ash content of a paper. Utecht et al does not disclose the mass ratio of cationic polymer to filler.

Carr teaches that a typical process of making paper generally known in the art that comprises feeding an aqueous suspension containing cellulosic fibers, and optional fillers and additives into a headbox, ejecting the suspension onto a forming wire, and draining the water from the web. It is well known in the art that the function of a retention aid is to increase the adsorption of fillers onto the cellulosic fibers or to bind

the fillers to the cellulosic fibers (Carr et al, p 1, pars 3 and 4; Varveri et al, col 1, lines 23-29) thus fixing the fillers to the fibers in the pulp is inherent in the use of the cationic polymer as a retention aid or, at least, would have been obvious to one of ordinary skill in the art, as is increased ash content over not using the cationic polymer.

Carr does not disclose the claimed ash content or the mass ratio of cationic polymer to filler.

Takahata et al discloses a laminated decorative sheet (construction material) comprising a base paper loaded with titanium-oxide or other filler to impart desired color or opacity (Abs; col 3, lines 22-32).

Snow et al discloses a cigarette tipping paper comprising from 20% to 40% by weight of calcium carbonate to impart opacity (Abs; col 3, lines 38-40).

Koichi et al discloses a filled paper comprising from 5 to 35 parts (based on 100 parts bone dry weight) by weight of a mixture of calcium carbonate and titanium dioxide to impart opacity and whiteness. The papers made include India paper (Abs; pars 0001, 0002 and 0018).

The art of Utecht et al, Carr, Takahata et al, Snow et al, Koichi et al and the instant invention is analogous as pertaining to papers containing fillers. It would have been obvious to use papermaking stock comprising common additives and generally known papermaking process to make a paper from a slurry containing the claimed filler and the claimed amount of a vinylamine containing polymer of Utecht et al in view of Carr and further in view of Takahata et al, Snow et al or Koichi et al to obtain a filled paper having good retention of the filler. It would further have been obvious to make a

base paper for the claimed kinds of papers to provide the disclosed opacity needed for the products. It would further have been obvious to obtain the claimed ash content corresponding to the filler content of the disclosed papers. The ratio of the amount of vinylamine disclosed by Utecht et al to the filler content of the papers of Snow et al and Koichi et al overlays the claimed range.

The method made obvious over the prior art is substantially the same as the claimed method, and the opacity of filler containing paper produced will be enhanced or, at least, such enhancement would have been obvious because, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "Products of identical chemical composition can not have mutually exclusive properties."

(10) Response to Argument

Appellant argues (p 9-11) that the polymers of Utecht et al are carbamate-functionalized vinylamine polymers, that polyfinylformamides that contain from 10 to 90% of vinylamine units are merely starting materials, in which at least 2 mol-% and preferably from 5-10 mol-% of the amino groups are reacted with haloformic acid. In some embodiments, all amino units can be reacted with the haloformic acid. In contrast, the claimed polymer is obtained by 20 to 100% hydrolysis of the total formyl groups in a polymer having at least N-vinylformamide units and none of the vinylamine units is carbamate-functionalized.

Claims 4 and 9 require "a cationic polymer containing vinylamine units...wherein the cationic polymer component is defined in terms of component (A) ... a polymer obtained by 20 to 100% hydrolysis of the total formyl groups in a polymer having at least N-vinylformamide units as a polymerization unit..."

The vinylamine polymer of Utecht et al is obtained by homo- or copolymers of N-vinylformamide obtainable by copolymerization of N-vinylformamide and other monomers, and subsequent hydrolysis by acids, bases or enzymes of from 0.1 to 100 mol-% of the N-vinylformamide units to form vinylamine units (col 3, line 62 to col 4, line 7). Thus the polymer containing vinylamine units is made by the claimed process. The vinylamine polymers are reacted with haloformic esters to provide modified polymers containing carbamate units (col 5, lines 5-10 and 38-51). The proportion of NH (amino) groups of the polymers which are customarily reacted with haloformic esters is at least 2 mol-%, preferably 5-10 mol-%. It is also possible to react all of the NH groups (col 6, lines 2-10). Reaction of all of the NH groups can occur in only a single embodiment of the disclosed invention, whereas all other embodiments, including preferred embodiments, result in modified polymers contain vinylamine units. As evidenced by Lai et al, vinylamine polymers made by hydrolysis with a base are cationic.

The polymer of Utecht et al is made by the same method as claimed polymer, and the formed polymer is then partially functionalized. The claims do not exclude additional functionalization of the polymer, but only require the polymer to be "obtained by 20 to 100% hydrolysis of the total formyl groups in a polymer having at least N-vinylformamide units."

Appellant argues (pp 12-14) that the polymer of Utecht et al is not added to a pulp slurry in the relatively low amounts required by the claims. Appellant cites Utecht's teaching of using the polymers as emulsifiers to prepare aqueous filler slurries for filled papers, wherein the amount of emulsifier used is from 0.1 to 2, preferably 0.5 to 1.5% by weight based on the aqueous slurry. Appellant further argues that Utecht's teaching of the polymers used as retention, drainage and flocculation aids in papermaking in amounts of 0.01 to 0.1% by weight based on the dry fiber materials is seemingly inconsistent with the amounts used to prepare filler slurries.

There is no inconsistency in the disclosure of Utecht et al. The usage of the polymer to prepare aqueous filler slurries and the usage as retention, drainage and flocculation aids in papermaking cannot be compared to one another. The amount of polymer used in the aqueous filler slurry is based on the aqueous slurry, which does not contain papermaking fibers. In contrast, the amount used as retention, drainage and flocculation aids in papermaking is based on the dry fiber materials. The claimed invention uses 0.0005 to 0.4 wt-% of polymer based on the dry mass of the raw material pulp (dry fiber material). The amount of polymer disclosed by Utecht et al of 0.01 to 0.1% based on the dry fiber material significantly overlays the claimed range.

While Lai et al was only used as evidence that base hydrolyzed vinylamine-containing polymers are cationic, Appellant argues (p 12 and 14-19) that Lai et al also discloses addition of vinylamine-containing polymers in an amount of at least 0.05 wt-% and preferably 0.1 to 0.2 wt-% based on fiber to improve titanium dioxide retention in wood pulp, and that the disclosure of Lai et al would have suggested to one of ordinary

skill in the art that Applicant's claimed method does not work. Example 12 of Lai et al is cited.

In a previous discussion of Example 12 of Lai et al, the Examiner erred in stating that the vinylamine polymers used had an unknown degree of hydrolysis. Lai et al is clear that the polymers were vinylamine homopolymers (100% hydrolyzed). In Example 12, Lai et al tests retention of titanium dioxide in pulp using two vinylamine containing homopolymers having molecular weights of 7MM and 80M and two polyacrylamides of differing molecular weight and charge density (it is unknown whether the charge is cationic or anionic). The polymers were added in amounts from 0.01 to 1% (presumably weight percent) based on fiber. Table 4 and accompanying description indicate that the 7MM polyvinylamine demonstrated superior TiO_2 retention at 0.1-0.2% addition. The reader is left to assume that the values reported in the table are for one of 0.1% and 0.2% addition. It is noted that the performance of the 80M polyvinylamine is inferior to both the 7MM polyvinylamine and the high molecular weight PAM. Lai et al does not comment on any of the tests wherein the polymers were added at 0.01% and one of ordinary skill is again left to guess at the results, which Appellant apparently does in stating that Lai's polymer is said to be no more effective for improving titanium oxide retention in amounts less than 0.05 wt-% then the addition of 0 wt-% polymer or "without including the cationic polymer in the pulp slurry." This statement by Appellant has no basis in fact.

Lai et al is concerned with both retention and in improving dry strength through the addition of vinylamine polymers and recites the addition of at least 0.05 to 0.5 wt-%

and preferably 0.1 to 0.2 wt-% of polymer based on fiber to accomplish these goals (p 5, lines 54-57). Utecht et al, which post-dates Lai et al by almost a decade, discloses that the functionalized vinylamine polymer can be added in amounts as low as 0.01 wt-% based on fiber as a retention, drainage and flocculation aid. Utecht et al does not disclose adding 0.01-0.1 wt-% polymer to increase dry strength, but only as a retention, drainage and flocculation aid. One of ordinary skill in the art, reading both disclosures, would have found it obvious to use an amount of vinylamine polymer in the claimed range with a reasonable expectation of success in achieving improved retention, drainage and/or flocculation.

Appellant's argument that persons skilled in the art rarely act in a manner inconsistent with prior art preferences further supports the Examiner's conclusion. One of ordinary skill in the art, reading both disclosures and interested in retention but not necessarily in increasing dry strength, and also being conscious of the cost of additives used in papermaking, would have found it obvious to use a lesser amount of vinylamine polymer in the claimed range with a reasonable expectation of success in achieving improved retention, drainage and/or flocculation.

It is noted that Appellant agrees (p 22) that the purpose of retention aids (evidenced by Carr and Varveri et al) is to increase adsorption of fine particles onto cellulosic fibers or to bind the filler to cellulosic fibers. Note that the citation in Carr et al exemplifies fine particles to include fine fibers and filler particles, and Varveri et al recites "Retention aids are commonly used in the manufacture of...paper, where high loadings of pigment and/or filler are required. The function of the retention aid is to bind

the filler to the cellulosic fibers..." Appellant then states (p 24) that the objective evidence of record shows that fixing titanium dioxide fillers to fibers in a pulp slurry is NOT an inherent or obvious function in the use of any cationic polymer having vinylamine units as a retention aid. The agreement with the purpose of a retention aid and statement that a cationic polymer having vinylamine units used as a retention aid does not inherently or obviously fix titanium dioxide fillers to fibers in a pulp slurry appear to be contradictory, but is apparently based on Example 12 of Lai et al. However, one of ordinary skill in the art using a cationic vinylamine polymer as a retention aid and in the amounts from 0.01 to 0.1 wt-% based on fibers as taught by Utecht et al would fully expect it to function as a retention aid should and to fix fillers, such as titanium oxide or calcium carbonate, to fibers in the pulp.

Appellant states (p 24) that "Lai et al could not achieve improved TiO_2 retention in its experiments utilizing less than 0.05 wt-% poly(vinylamine) homopolymer." This statement, too, is without factual basis because Lai et al fails to comment on the use the polymers in lesser amounts for retention, and because Lai et al recites a minimum of 0.05 wt-% to provide retention and dry strength. In addition, Utecht et al discloses using a lesser amount of its polymers as retention, drainage and flocculation aids.

Appellant argues (p 26) that persons having ordinary skill in the art would have expected the disclosed fixing effects for polymers of Utecht et al in specified amounts from 0.001 to 0.1 wt-% relative to fixing "contraries" in papermaking processes, but the fixing effects are not applicable to fixing fillers such as titanium oxide and chalk in papers containing large quantities thereof. To summarize the discussion above, Utecht

et al discloses use of cationic vinylamine containing polymers used in amounts overlaying the claimed range as retention, drainage and flocculation aids in papermaking. The purpose of retention aids is to increase adsorption of fine particles, such as fillers, onto cellulosic fibers or to bind the filler to cellulosic fibers (reads on fixing fillers to the fibers). Titanium dioxide and calcium carbonate (e.g.-chalk) are commonly known fillers (Utecht et al) used to make filled paper and one of ordinary skill in the art using a cationic vinylamine polymer as a retention aid and in the amounts from 0.01 to 0.1 wt-% based on fibers as taught by Utecht et al would fully expect the polymer to function as a retention aid and to fix fillers, such as titanium oxide or calcium carbonate, to fibers in the pulp, even with high loading of fillers (see citation from Varveri et al).

Appellant's remaining arguments on pp 20-22 are similar to those discussed above and warrant no further comment.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Dennis Cordray/

Examiner, Art Unit 1741

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